DOCUMENT RESUME

ED 274 075 EA 018 838

TITLE Class Size. What Research Says About Series, Number 2. Data-Search Reports.
INSTITUTION National Education Association, Washington, D.C. Research Div.
PUB DATE Feb 86
NOTE 16p.
AVAILABLE FROM Publication Sales, NEA Professional Library, P.O. Box 509, West Haven, CT 06516 (Stock No. 3108-3-10; $8.95).
PUB TYPE Information Analyses (070) -- Reports - Descriptive (141)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Academic Achievement; *Classroom Environment; *Class Size; Elementary Secondary Education; Research Needs; *Student Attitudes; *Student Motivation; *Teaching Conditions

ABSTRACT

Recent research offers strong evidence that reduced class size has positive effects on improved student achievement, teachers' work conditions, and the quality of the classroom environment. This report presents a brief historical perspective on the research into the effects of class size; summarizes studies that discuss the relationship between smaller classes and student achievement; and presents research evidence concerning the effects of class size on the educational environment, including such psychological factors as attitudes, motivation, and morale. Summaries provide additional insights, implications, and research highlights, and indicate the need for longitudinal studies on class size in conjunction with such other variables as subject matter and instructional design. Twenty-six references are appended. (IW)

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# RESEARCH

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# •What Research Says About:

# CLASS SIZE

## Number 2

EA 018 838

*Professional and Organizational Development/Research Division*

# Foreword

Association leaders, staff and members have historically maintained a strong interest in the issue of smaller class size. Recent research is contributing supportive evidence that reduced class size does have positive effects on improved student achievement, conditions of work for teachers, and the quality of the classroom environment. These newly emerging findings stand in contrast to earlier research efforts that can only be described as inconsistent and inconclusive. Over time, researchers have learned how to use more sophisticated study designs and data analyses to document the complex relationships that must be considered when investigating the potential effect of reducing teacher and pupil ratios. Now, the outcomes of well designed studies that have been completed and some that are underway offer stronger and more persuasive evidence in favor of reduced class size. In fact, as will be noted, some state policy makers are beginning to understand and support efforts to assign fewer students to teachers.

This report first presents a brief historical perspective on the research into the effects of class size. Then, the relationships between smaller class size and student achievement are discussed. Next, research evidence concerning class size effects on the educational environment including such psychological factors as attitudes, motivation, morale, etc. are described. And finally, implications and research highlights are summarized. It is hoped that this research briefing on class size will prove to be a valuable addition to the knowledge base for discussions and planning action strategies to continue efforts to achieve smaller class size.

*February 1986*

**CLASS SIZE**

**Number 2**

# RELATIONSHIP OF CLASS SIZE AND STUDENT ACHIEVEMENT

From a historical perspective, J. M. Rice is credited with conducting the first empirical study on educational processes and their effects on student achievement. This study was published in *The Forum* in 1902. Although it included virtually no numbers, Rice observed no strong relationship between class size and attainment. Since this date, the findings of voluminous research studies have been reported. In a recent review of more than 3,000 studies, Willis D. Hawley et al., explain the inconsistencies in the conclusions reached by different analysts as follows:

1. The effects of class size reductions require complex statistical analysis.
2. The better the research design, the stronger the effect of class size reductions found.
3. Older studies showed few or no effects; newer studies show generally positive effects.
4. An effect of class size seen to be significant by one researcher may be termed insignificant by another, depending on the type of analysis used.
5. In many cases, reductions in class size do not result in evidence to show changes in teacher behavior, but such changes—or the lack thereof—are frequently not studied.

Again, historically, Glass and Smith categorized the four stages of research on class size as follows:

1895 – 1920 = the pre-experimental era
1920 – 1940 = the primitive experimental era
1950 – 1970 = the large-group technology era
1970 – present = the individualization era

A continuing volume of research studies have tried to find a more comprehensive and conclusive answer to the difficult question: What is the optimum/ideal class size to improve academic performance? Cited below are the findings of some of the major research studies concerning the relationship between class size and student achievement:

**Walberg, Herbert J. and Sue Pinzur Rasher, "Public School Effectiveness and Equality: New Evidence and its Implications," *Phi Delta Kappan*, 56 (September 1974), pp. 3-9.**

In this study, the percentage of Selective Service draft candidates who failed the mental test in 1969 and 1970 in all 50 states was compared with nine socio-economic and educational variables. Pupil-teacher ratio was one of these educational inputs found to have affected the Selective Service examination scores of the military draftees. This test of general ability consisted of 100 vocabulary, mathematics, spatial, and mechanical items, many of which reflect specific abilities that can be acquired in school. The results of this comprehensive study show that "high pupil-teacher ratios . . . of children enrolled in public schools are associated with high rates of test failures."

In a subsequent report of this study (*Phi Delta Kappan*, May 1977), the authors state that "a reduction of one pupil per teacher is associated with an estimated 7.9 percent reduction in failure rate when the other variables are controlled. Although administrative, supportive, and capital expenditures are necessary, smaller classes may pay off because of the intensified, direct services they allow the teacher to provide the children. In particular, small classes permit more individual guidance, small-group work, and discussion without the constraints of authoritarian control often required in large groups."

**Porwoll, Paul J., *Class Size: A Summary of Research*. Arlington, Va.: Educational Research Service, Inc., 1978.**

This research brief is a comprehensive review of the literature on class size and achievement of elementary and secondary students as well as the effects of class size on other related areas. (Findings on the effects of class size and the educational process will be included in the next section of this report.) Based upon the analysis of 24 studies, the investigator found the relationship of class size and achievement to be inconclusive, contradictory and complex. The

*tentative* conclusions related to the effects of class size and pupil achievement are as follows:

- Research provides no clearcut guidelines for an "optimum" class size covering all types of students at all grade levels. Students at different levels of personal and academic development require different learning conditions in order for optimum gains in achievement to occur.
- Existing research findings do not support the contention that smaller classes will of themselves result in greater academic gains for pupils. The evidence is that within the mid-range of about 25 to 34 pupils, class size seems to have little if any decisive impact on the academic achievement of most pupils in most subjects above the primary grades.
- There is research evidence that small classes are important to increase pupil achievement in reading and mathematics in the early primary grades.
- There is some evidence of a positive relationship between small class size and pupil achievement when primary grade pupils are taught in small classes for two or more consecutive years.
- There is evidence that pupils with lower academic ability tend to benefit more from smaller classes than do pupils with average ability.
- Some research indicates that smaller classes can positively affect the scholastic achievement of economically or socially disadvantaged pupils.
- More longitudinal studies are needed to measure the relationship between achievement and instructional changes when class sizes are reduced.

**Glass, Gene V. and Smith, Mary Lee, "Meta-Analysis of Research on the Relationship of Class-Size and Achievement. The Class Size and Instructional Project." San Francisco, Calif.: Far West Laboratory for Educational Research and Development, September 1978. [ED 168 129]**

This is the most comprehensive research study to date on the issue of class size. It has received both national and international attention and has provided evidence of the positive relationship between reduced class size and pupil achievement. In this meta-analysis of research, 77 empirical research studies were read, coded, and analyzed. These studies yielded over 700 comparisons that were based on data that span 70 years of research performed in more than a dozen different countries and all together incorporated achievement test results of over 900,000 pupils. This integrative analysis was unique in that it represented a statistical synthesis that revealed general trends.

The study found that small achievement advantages were noted when small reductions were made in class size in the 20-30 pupil range and large advantages resulted when class size was reduced below 20. Pupil achievement was found to be higher in small classes and highest in very small classes (under 20). The relationship between class size and achievement seems consistently stronger in the secondary grades, but it does not differ appreciably across different school subjects, levels of pupil IQ, or several other demographic features of classrooms. Overall, the researchers found that "among the 725 comparisons of pupil achievement in smaller and larger classes, 435 or 60 percent favored the smaller class."

This newly documented relationship between class size and achievement contradicts previously published reviews of research, whose authors maintained that reducing class size would not result in greater achievement. Many aspects of this study have been both heralded and criticized by many researchers and educators.

**Cotton, K. and Savard, W. G., "Class Size. Research on School Effectiveness Project: Topic Summary Report." Portland, Oregon: Northwest Regional Educational Laboratory, December 12, 1980. [ED 214 705]**

To answer the question, "Do small classes have a positive effect on the academic achievement of elementary and secondary students?" the authors reviewed 35 documents of which 20 were deemed

valid studies. These studies provided considerable support for the following hypotheses:

1. Small classes have a positive effect on the academic achievement of elementary and secondary students
2. Small classes have a positive effect on student attitudes and behavior, teacher morale, classroom procedures and other indicators of the quality of the classroom environment.
3. There is no optimal class size for all instructional situations. Appropriate class size is dependent on student age/grade, student aptitude, subject taught and instructional methods used.

Although "small classes" and "large classes" were inconsistently defined in the studies, in general, the research indicates that small classes can be beneficial in certain situations: For example, the achievement of disadvantaged, low-ability, special education or primary age students is enhanced by smaller classes; very small classes (5 or fewer students) appear to produce considerably higher achievement than average size classes.

Data in this study supported the conclusion that "reducing or increasing class size will not automatically produce any particular, foreseeable effect on achievement, . . . however, smaller class size has the potential for stimulating the development and use of improved instructional methods, but will not automatically do so."

**Carrington, Andrew T. et al., "Class Size Project, 1980-1981. Final Report." Virginia Beach, Va.: Virginia Beach City Public Schools, August 1981. [ED 237 521]**

This project resulted from a directive of the Virginia Beach school board to determine the effects of class size on the reading achievement of pupils in the lower elementary grades. The research design consisted of pairs (control and experimental groups) of first-grade classes from eight schools, each with 29 and 21 students, respectively. The student/teacher ratios in both of the groups were below the maximum of 30 students, as mandated by the Southern Association of Schools and Colleges and enacted by the Virginia General Assembly. The participating classes and teachers were chosen and assigned randomly. The first graders were administered pre- and post-tests of the California Achievement Tests to measure their reading achievement gains during the school year. The results of the study showed that:

- First-graders in smaller classes scored significantly higher on reading achievement tests than did their peers in larger classes.
- Both sexes of white first-graders scored significantly higher in small classes than in larger ones.
- There was no significant difference between the reading achievement scores of nonwhite students in small and large classes. (Only 32 nonwhite students participated in the study.)

**Walberg, Herbert J., "What Makes Schooling Effective? A Synthesis and Critique of Three National Studies." *Contemporary Education Review*, Spring 1982, pp. 23-34.**

H. J. Walberg, D. Schiller and G. D. Haertel recently assembled a collection of research reviews that were published from 1969 to 1979 on instructional and related research on learning, conducted in elementary, secondary and higher education schools. Table II in this article, which gives a selective summary of the research topics included in this decade of educational research, shows that 60 percent of 691 comparisons found that students in smaller classes achieved at a higher rate.

**Doss, David and Holley, Freda, "A Cause for National Pause: Title I Schoolwide Projects." Austin, Texas: Austin Independent School District, Office of Research and Evaluation, March 1982. [ED 214 996]**

Title I and local funds were used to establish two schoolwide projects in Austin, Texas, where pullout programs were ended and the pupil/teacher ratio was lowered to 15-1. Students in grades 2-6 from Title I

Schoolwide Project (SWP) schools were compared with comparable students from Title I Regular (TIR) schools using the Iowa Tests of Basic Skills administered in April of 1980 and 1981. Evaluation findings revealed that:

- The lower pupil/teacher ratio seems to improve achievement meaningfully in *all* basic skill areas.
- The project teachers had very high morale. They felt more effective in their work.
- The lower pupil/teacher ratio may have more impact on the quality of instruction (less off-task time, better teacher monitoring of work, earlier corrective feedback, fewer adults with instructional responsibiity for the child, fewer disruptions, etc.) than on the quantity.
- Lowering the pupil/teacher ratio from 25-1 to 15-1 would increase personnel costs by 67% in the schools and grades where applied.
- Adequate classroom space can be a problem.

**Hedges, Larry V. and Stock, William, "The Effects of Class Size: An Examination of Rival Hypotheses." *American Educational Research Journal*, Spring 1983, pp. 63-85.**

In a current reanalysis of the statistical procedure used in the class-size meta-analysis by Glass and Smith (reviewed in this report), Hedges and Stock found no substantial changes in conclusions originally drawn. They confirmed the findings of Glass and Smith that smaller classes lead to higher expected achievement than larger classes. They concluded, however, that "the tests of significance confirm that class size accounts for a substantal amount of achievement variation, while also indicating that substantial sources of systematic variation remain to be explained."

# RELATIONSHIP OF CLASS SIZE AND THE EDUCATIONAL ENVIRONMENT

Numerous research studies have investigated how reduction in class size is associated with the teaching process and affective outcomes. Data from these studies reveals that class size affects the quality of the classroom environment; pupil's attitudes, interest and motivation; teacher's morale, satisfaction, and attitudes toward their pupils; instructional techniques, etc. The findings of selected studies are summarized below.

**Lindbloom, Dwight H., "Class Size as it Affects Instructional Procedures and Educational Outcomes." Minneapolis, Minn.: Educational Research and Development Council of the Twin Cities Metropolitan Area, Inc., June 1970. [ED 059 532]**

The purpose of this extensive review of literature was to ascertain the relationship between educational outcomes and class size in elementary and secondary schools.

This study was based upon the assumption that if pupil behavior is to change (learning process), teacher behavior must also change (teaching process). Thus, in reviewing the literature, Lindbloom states that "the examination of the teaching process in terms of teaching methods and classroom environment measures has been separated from the examination of the learning process in terms of achievement measures."

The author concludes that the evidence advanced in appraising the teaching process and all measures other than pupil achievement overwhelmingly favor small classes. The studies report the following positive practices taking place more frequently in smaller than in larger classes:

1. Individualized instruction geared to the needs and interests of students.
2. In addition to the textbooks, wider use of a variety of educational materials to enrich teaching.
3. Increased interaction among pupils and between teacher and pupils.
4. Greater use of innovative or new materials and methods.
5. More student self-control and discipline with less teacher domination.
6. More small group work.
7. Improved human relations among students and with the teacher.
8. A greater number of instructional activities.
9. Fewer discipline problems.
10. Improved morale among teachers.

In conclusion, the author states: "merely reducing class size is no guarantee of increased pupil achievement in the smaller class. What does seem to happen (naturally, in not every case), according to the research studies, is that a reduction in class size causes teachers to adjust accordingly and modify the teaching process to a more individualistic and humanistic approach. . . . The research supports the hypothesis that small classes are superior to large classes in producing more desirable teaching practices."

**Olson, Martin N., "Research Notes-Ways to Achieve Quality in School Classrooms: Some Definitive Answers." *Phi Delta Kappan*, September 1971, pp. 63-65.**

One among other major purposes of the study reviewed in this article was to find an answer to the question: "What effects do class sizes of 5, 15, 25, or 36 have on classroom performance levels?" The criterion of classroom quality used in the study was Indicators of Quality—a highly reliable and valid measure of quality designed to specifically assess a school system's classroom processes.

The findings of this study were based on the results of observations conducted in 9,961 elementary and 8,567 secondary classrooms in 112 largely suburban school districts located in 11 metropolitan regions across the United States over a period of seven years. From 40 key concepts, Olson developed a list of 51 acts of student and teacher behavior that can be observed in a classroom and rated either positive or negative. He then compared the school district's

achievement scores as a whole with the classroom observations. He found certain "critical breakpoints" where performance scores drop sharply. At the elementary level, he pinpoints 5, 15, and 25 pupils per class, and at the secondary level, 10 and 16 pupils per class.

The data revealed that the relationship between class size and the criterion scores was well defined and consistent throughout each level of analysis. "Any way one tries to slice it, smaller classes produced significantly higher scores than large ones" in both elementary and secondary schools. The results were so pronounced that the author suggested that school systems consider altering their class-size ratios near the critical breakpoints (where performance scores drop sharply) in the analysis. This study firmly established that smaller classes produce significantly higher performance scores. Olson states that "school system administrators and teachers should place major emphasis on *varying* class sizes that fit the unique needs of particular subjects with a careful view toward realistic, well-defined purposes for the various styles of educational activity."

**Olson, Martin N., "Research Findings that Support Small Class Size." *Class Size*. Washington, D. C.: National Education Association, 1977, pp. 16-26.**

Many teachers and parents believe strongly that smaller classes are vital in providing and maintaining a higher quality educational environment. Although research findings on the study of class size have been diverse, nevertheless, research and theoretical literature is replete with a great range of actual learning outcomes that are achieved when fewer students are placed with more teachers in educational settings. Based upon the findings of over 60 high quality studies, Olson developed the following nine generalizations with supportive bibliographic evidence that clearly enunciate the learning conditions and learning outcomes that are achieved when teachers have fewer rather than more students to work with (in general, approximately 25 students or less):

1. Teachers employ a wider variety of instructional strategies, methods, and learning activities and are more effective with them
2. Students benefit from more individualized instruction
3. Students engage in more creative and divergent thinking processes
4. Students learn how to function more effectively as members and leaders of groups of varying sizes and purposes
5. Students develop better human relations with and have greater interpersonal regard for other students and their teachers
6. Students learn the basic skills better and master more subject matter content
7. Classroom management and discipline are better
8. Teacher attitudes and morale are more positive
9. Student attitudes and perceptions are more positive.

**Wright, Edgar N. et al., "Effects of Class Size in the Junior Grades—A Study." Toronto: Ontario Department of Education, 1977. [Ed 147 923]**

This study, sponsored by the Toronto Board of Education, was designed to examine experimentally the differences between four class sizes which ranged from size 16 (the size of many special education classes) to size 37 (the approximate size of the largest regular classes in Toronto schools). Specifically, this study investigated the effects of class size on: teachers' expectations about the effects of specific class sizes; the attitudes and opinions of students, parents, and teachers; student achievement in reading, vocabulary, mathematics, composition, and art; the academic self-concept of students; and a variety of classroom process variables (e.g., teacher-pupil interaction, pupil participation, method of instruction, subject emphasis, use of educational resources, classroom atmosphere).

Sixty-two grade 4 and 5 classes in 11 schools in Metropolitan Toronto participated in the two-year

study. In the first year, teachers and grade 4 students were randomly assigned to classes of size 16, 23, 30, or 37. For the second year, the same teachers and students were similarly assigned to grade 5 classes, with the constraints that students should not be in a class size of 16 or 37 for both years of the study, and that teachers who taught classes of the two larger sizes receive classes of the two smaller sizes.

Prior to the study, teachers had positive expectations that the smaller classes (16, 23) would enable them to provide for more individualization, develop better rapport with pupils, resulting in academic improvement, enhanced pupil self-confidence and independence, as well as a more relaxed and enjoyable classroom environment. It was discovered that teachers' expectations remained quite stable.

Standardized tests that were used to measure academic achievement showed a statistically significant class effect in only one of four areas assessed, mathematics concepts. Scores in this area were significantly higher in classes of 16 than in classes of 30 or 37. There were no significant differences found for the measures of students' development in reading, vocabulary, mathematics problem solving, art and composition. Reading was taught more frequently in classes of 16 than in classes of larger size.

Students' attitudes toward school and their academic self-concepts were not affected by class size. Also, changing class size did not produce major changes in pupils' participation.

Reducing class size (16 or 23) made a big difference to teachers in such areas as class management and supervision. The data revealed that teachers reported making the most change in physical layout (82 percent), evaluation (72 percent), class management (71 percent) and supervision (66 percent).

This study demonstrated that within a narrower range of class size (i.e., 16 to 37), it makes a large difference to the teachers but little difference to the students or to the instructional methods used. It was a study of "what happens" when class size is changed, but not a study of "what can happen."

**Porwoll, Paul J., *Class Size: A Summary of Research*. Arlington, Va.: Educational Research Service, Inc., 1978.**

In this research brief, the author includes a comprehensive review of 17 research studies on the effects of class size on instruction. He states that the evidence accumulated supports the following *tentative* conclusions:

- Research on class size suggests the importance of an emphasis on the methods and quality of instruction in the classroom rather than on the quantity of pupils in the classroom.
- There is considerable and consistent research evidence that certain teaching procedures and practices perceived by some educators as conducive to a productive learning environment . . . occur more frequently in smaller classes than in larger classes.
- Few if any pupil benefits can be expected from reducing class size if teachers continue to use the same instructional methods and procedures in the smaller classes that they used in the larger classes.
- Some studies have found that even when teachers have small classes, many teachers do not take advantage of them to individualize instruction.
- Smaller classes appear to have a positive effect on pupil behavior in the elementary grades. At the secondary school level, some studies, but not others, have indicated that smaller classes influence student perceptions about their courses and their satisfaction with them.

**Smith, Mary Lee and Glass, Gene V., "Relationship of Class-Size to Classroom Processes, Teacher Satisfaction and Pupil Affect: A Meta-Analysis." San Francisco, Ca.: Far West Laboratory for Educational Research and Development, July 1979. [1 ED 190 698 1]**

This study is a companion document to the meta-analysis of the effect of class size on achievement

(Glass and Smith, 1978) summarized in the previous section of this report. Using data from this previously completed research, the authors attempted to answer the question of whether decreasing the size of classes produces improvements on non-achievement outcomes—teaching processes, and student and teacher effects in the affective domain. A summary of their affirmative answer is as follows:

- On all measures, reduction in class size was associated with higher quality schooling and more positive attitudes.
- Teachers feel better and feel they perform better in smaller classes: The difference in a teacher's workload, attitudes about students, morale, and general satisfaction varied from the 50th percentile in a class of 30 pupils to the 76th percentile in a class of 15. The difference in teacher effects in a class of 10 versus a class of 40 was 49 percentile ranks.
- Class size had an impact on pupils' attitudes, interests and opinions. There also seemed to be less apathy, friction, and frustration. The difference in pupils' attitudes toward school, interest in the subject matter, classroom behavior, etc. was 14 percentile ranks between classes of size 15 and 40.
- The opportunities for individualization, varied and adaptive learning activities, social interaction, and friendly relationships were greater in the smaller classes. Classes varied on this effect between the 70th percentile in a class of 10 pupils to the 45th percentile in a class of 40 pupils.
- The class size effects were related to pupil age, with effects greatest for pupils 12 years and under, somewhat less for pupils 13 to 17, and least for pupils 18 and over.

**Filby, Nikola et al., "What Happens in Smaller Classes? A Summary Report of a Field Study. Class Size and Instruction Project." San Francisco, California: Far West Laboratory for Educational Research and Development, January 1980. [Ed 219 365]**

The purpose of this field study was to describe changes (and lack of changes) in instructional processes and teacher and student behavior when class size was reduced by one-third midway through the school year. Two second grade classes from two schools participated: a rural school in Virginia, and an inner-city school in California. In the Virginia school, class size began at 20 and was reduced to 13 during the second week in January. In the California school, class size began at 35 and was reduced to 22 at the end of January. Student assignments were basically random within general achievement strata, so that the range of student achievement levels remained the same before and after the split. Records of classroom observations before and after this change were compared to determine the impact of class size on such things as: the general quality of instruction, grouping and instructional activities, how lessons are conducted, classroom management techniques, how teachers monitor and evaluate student work, the nature of classroom interactions, and pupil engagement in learning activities. The personal journals of teachers and teacher interviews were also part of the research data.

The researchers found that in all four classes definite changes occurred when class size was reduced: (1) teachers were able to monitor student work more closely; (2) students were more attentive; (3) the curriculum was improved in greater depth, breadth, and richness; (4) teachers were more relaxed and positive with students; (5) teachers were better able to focus on individual student needs. On the other hand, some things remained the same regardless of class size. General instructional approaches and methods of discipline remained constant, and students seldom received more opportunities to make choices. These changes, however, were not necessarily caused by the class size reduction. Small classes gave the teachers a chance to implement an approach more fully and more effectively in accordance with their existing style and plan of instruction. In other words, easing the constraint of class size enabled teachers to do more or better what they already intended.

# IMPLICATIONS OF CLASS SIZE RESEARCH

As previously stated, the issue of class-size is a continuing concern. State legislatures, school administrators, teachers in in-service programs, and professional journals have continued debating and discussing this issue. The Smith and Glass (1978) findings in their meta-analysis on class-size have given impetus to research in this area. Widely publicized national studies gave credence to the fact that teaching and learning are more effective when students are taught in smaller classes.

In this period of educational reform, class size statutes have been enacted, and school administrators have implemented organizational strategies to reduce pupil/teacher ratios in the public schools as cited below:

A. The October 16, 1985 issue of *Education Week* reported that at least 15 states (Delaware, Indiana, Kentucky, Louisiana, Michigan, Montana, Nevada, New York, North Carolina, Ohio, Tennessee, Vermont, Washington, West Virginia, and Wisconsin) have passed measures aimed at reducing student-teacher ratios in the elementary grades. It was also reported that the governor of Alabama has called for a reduction in the size of kindergarten classes to 20 students. The majority of these measures have specified class sizes of from 20 to 29 in grades K-3, and from 25 to 31 in grades 4-6.

B. The first state program to reduce student-teacher ratios was Indiana's PROJECT PRIME-TIME, which is now in its fourth year. The governor proposed this experimental program "to improve students basic skills in reading, writing and arithmetic by reducing class size in the critical, early-learning grades of K-2."

C. The National Association of Elementary School Principals has launched efforts to lobby state lawmakers to reduce student-teacher ratios in the early grades. In their recently issued report, "Standards for Quality Elementary Schools, Kindergarten through Eighth Grade," they listed among the standards and indicators in describing an excellent school: "Classes have no more than 20 students—even fewer in kindergarten and the primary grades."

D. The Board of Education in New York City has set the following goals of limiting class size:

   Kindergarten — maximum of 25 pupils

   First grade — an average of 25 and maximum of 28

   Elementary grades above the first grade and in junior high — average of 29

   High school academic classes — a maximum of 34 students

E. An article in the Fall 1985 issue of ERS Spectrum reviewed the progress of an experimental study being conducted in one of the 14 Centers for Excellence in the Teaching of Basic Skills to Economically and Educationally Disadvantaged Students under the Tennessee Better Schools Program. Helen P. Bain, a former President of the National Education Association, is director of this center located at Tennessee State University in Nashville. This center launched a 3-year project in 1984 to study the effects of reducing class size from 1:25 to 1:15 in grades 1-3 on reading and mathematics achievement, behavior, attendance, and self-concept. A second purpose is to identify changes affecting the teaching-learning process and to review teachers' perceptions of classroom conditions.

F. The William Hatch School (K-6) in Oak Park, Illinois, implemented an innovative "rescheduling" program that 1) reduces class size from 25 to 15 students per teacher, 2) increases the time teachers can spend with individual students, 3) increases the time students spend on-task, 4) increases parent and teacher expectations of students, and 5) improves student/teacher relations. The principal in this

school rescheduled the program and rearranged the instructional staff to reduce class size in the core academic subjects to 15 students per teacher. For example, the media specialist, counselor, reading specialist, art teacher, or any other teacher with dual certification may teach a class of 15 students in the morning and go back to providing their special services during the afternoon. The core subjects, with the exception of science, are taught in a 3-hour block of uninterrupted time each morning.

G. The National Council of Teachers of English has recommended the following: (1) that secondary-level English teachers have no more than four classes per term and no more than 25 students per class; and (2) that elementary-level teachers, who are necessarily involved in the teaching of writing, teach no more than 25 students. The Council also established a Task Force to Study Class Size in Secondary Instruction in 1984. This group was responsible for summarizing the current state of knowledge on the effects of class size and workload on secondary English instruction, describing needed research on the effects of altered class size and workload, and suggesting means of funding such studies and appropriate agencies for conducting them.

# SUMMARY

Class size is a complex problem that depends on many factors. There are some uncertainties concerning the magnitude of and the precise conditions that would promote a class size effect. The central theme which runs through the current research literature is that academic achievement does not necessarily improve with the reduction of student-teacher ratio unless appropriate learning styles and effective teaching styles are utilized. It is also evident that no single class size is best for all grade levels and all subject areas. However, based upon a current summary of research studies by Hawley, et al., there is considerable agreement that:

- Smaller class size seems to result in higher achievement among students who are economically disadvantaged.
- Students with lower academic ability seem to do better in smaller classes than in larger ones.
- It may be that class size affects student attitudes more significantly than it affects achievement.
- A direct effect of large class size is to lower the morale and increase the stress of teachers.
- There is typically little to be gained from reductions in class size that do not bring class size below 30.

The literature also indicates the need for longitudinal studies on class-size in conjunction with other variables such as subject matter and instructional design which directly affect the best class size for optimal learning.

In short, the many benefits to be derived from reducing class size have been well documented by the research. The funds can be made available if there is a willingness to make the commitment and set the proper priorities.

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